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for
Watertown Arsenal
Watertown 72, Massachusetts
Contract No. DA-30-115-ORD-376, Ordnance Project No. TB2-0001
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Submitted by

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Indentation Study

Preparations are being made to continue this phase of investigation in line with results of the discussion between Dr. Beeuwkes and the personnel of this laboratory. At present there is no result to report.

Bauschinger Effect

No progress.

Notched Bar Tests

Hardness Distribution of 24ST Aluminum

Additional data were collected pertaining to the hardness distribution in a notched bar subjected to plastic strain. Two sets of data has been added to those previously reported and are enclosed herewith.

Figure 1 represents hardness distribution of a quarter of a section of the notched bar, each reading or point representing an average of four readings of the notched bar. In this specimen there occurred two regions, at approximately 4 radii distant from the center line of the specimen, which exhibited relatively high hardness. To investigate the possibility of local non-homogeneity of the material another set of readings (Fig. 2) taken at a different section which was exposed by removing a quarter of an inch of material. The resulting investigation revealed that the higher hardness was due to the non-homogeneity of the metal. It is therefore, contemplated to employ another material which can be obtained in a more or less homogeneous form.

As an extension of the above notched bar tests a flat titanium specimen has been prepared with a photogrid. An experiment is to be conducted to determine strain distributions under conditions of plain stress.

Hydrogen Embrittlement Studies

There has not been an expenditure of time on this problem during the reported period.

DA-30-115-ORD-376

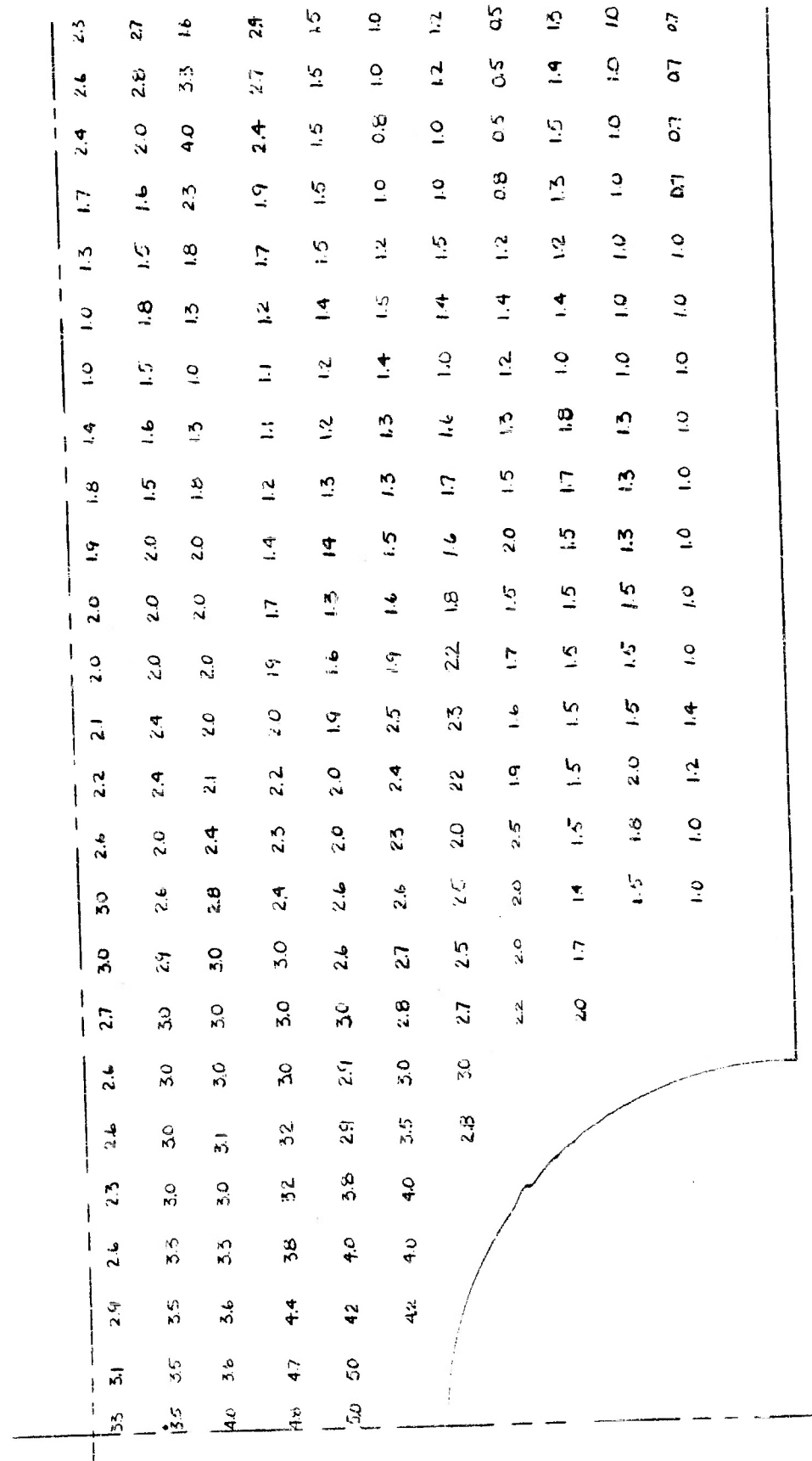


FIG. 1 NOTCHED BARS STRESSED TO 126% OF YIELD STRENGTH OF MINIMUM SECTION.

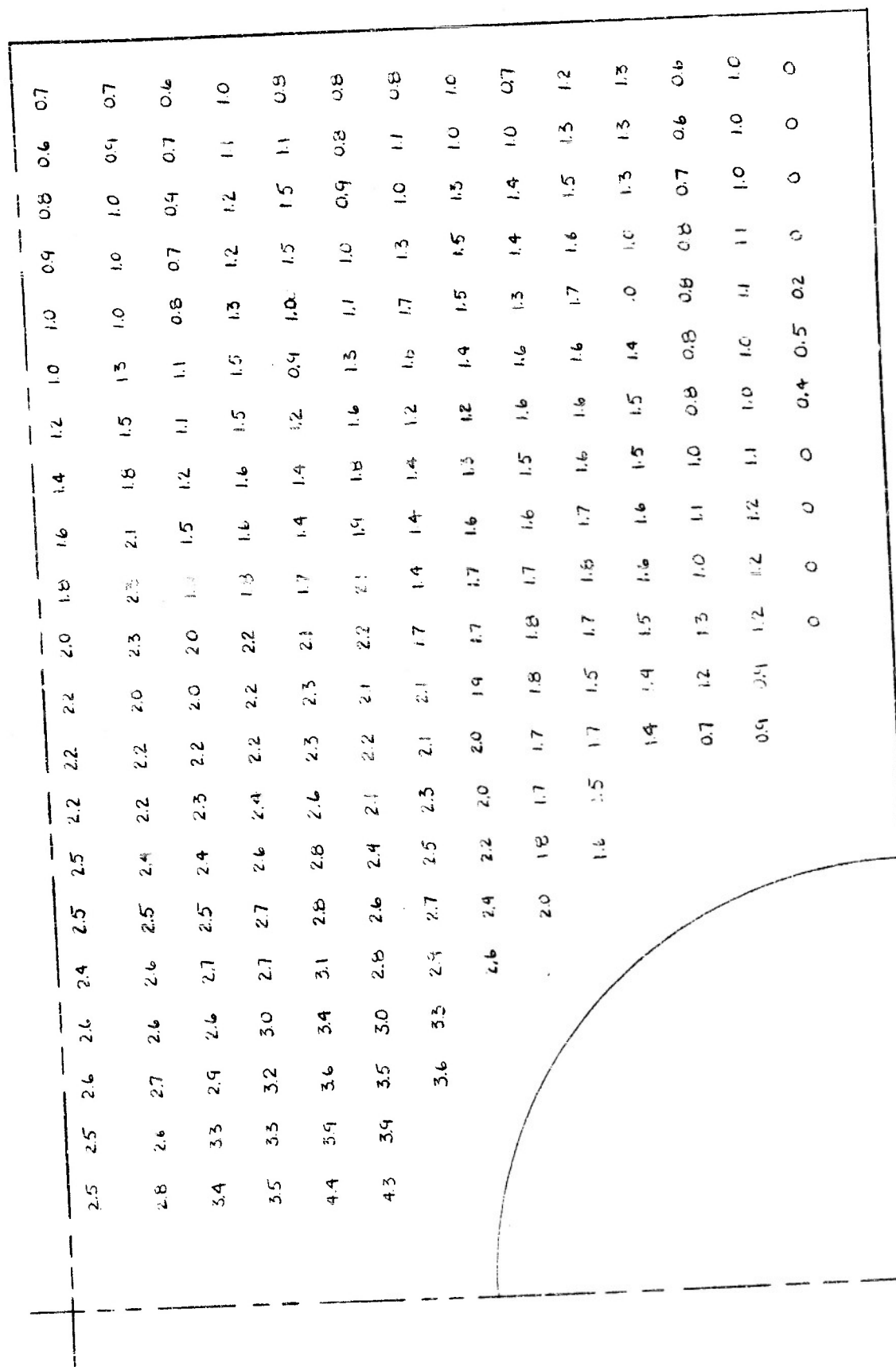


FIG. 2 NOTCHED BARS STRESSED TO 128% OF YIELD STRENGTH OF MINIMUM SECTION.